

Serial No. 10/657,179
Amdt. dated July 22, 2005
Reply to Office Action of May 13, 2005

Docket No. MRE-0063

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A device for compensating for heat generation in a modular IC test handler configured to receive cooling fluid from an exterior source and spray the cooling fluid onto modular ICs during testing, wherein the device is attached to a press unit including a frame and a plurality of push bars arranged at fixed intervals on a front surface of the frame for pushing edges of modular ICs mounted on carriers to connect the modular ICs to test sockets, the device comprising:

at least one supporting member provided adjacent to the press unit and having a cooling fluid flow passage formed therein for flow of cooling fluid; and

at least one cooling fluid spraying unit configured to spray the cooling fluid supplied through the cooling fluid flow passage toward faces of modular ICs in an oblique direction with respect to a central plane of the at least one cooling fluid spraying unit.

2. (Original) The device as claimed in claim 1, wherein the at least one cooling fluid spraying unit comprises a plurality of cooling fluid spraying units.

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3. (Original) The device as claimed in claim 1, wherein the at least one supporting member comprises a pair of supporting members, each having a cooling fluid flow passage formed therein.

4. (Original) The device as claimed in claim 3, wherein the at least one cooling fluid spray unit extends between the pair of supporting members.

5. (Original) The device as claimed in claim 3, wherein the at least one cooling fluid spray unit comprises a plurality of cooling fluid spraying units, which each extend between the pair of supporting members.

6. (Original) The device as claimed in claim 3, wherein each of the at least one cooling fluid spraying unit comprises:

a nozzle member having ends connected to the cooling fluid flow passages in the at least one pair of supporting members so as to be in communication therewith and arranged between adjacent push bars, the nozzle member having at least one cooling fluid spraying hole.

7. (Original) The device as claimed in claim 6, wherein the nozzle member comprises a plurality of cooling fluid spray holes formed at fixed intervals in a longitudinal

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direction of the nozzle member and directed away in a circumferential direction from a central plane the nozzle member forms, and wherein the plurality of cooling fluid spray holes is configured to spray the cooling fluid guided through the nozzle member toward the modular ICs in an oblique direction.

8. (Original) The device as claimed in claim 7, wherein the plurality of cooling fluid spray holes are arranged in a plurality of pairs.

9. (Original) The device as claimed in claim 1, wherein the cooling fluid flow passage in each of the at least one supporting member is divided into a plurality of fluid flow passages by at least one partition extending in a lateral direction.

10. (Original) The device as claimed in claim 9, wherein the cooling fluid flow passage in each of the at least one supporting member includes three cooling fluid flow passages divided by two partitions, respectively.

11. (Original) The device as claimed in claim 10, wherein the three passages comprise an upper flow passage, a middle flow passage, and a lower flow passage, and wherein the upper

flow passage is in communication with end portions of the nozzle members and the lower flow passage has an inlet configured to receive the cooling fluid from an exterior.

12. (Original) The device as claimed in claim 11, wherein the at least one cooling fluid spraying unit each comprises a nozzle member, and wherein the partitions have a plurality of connection holes provided at fixed intervals for flow of the cooling fluid introduced thereto through the lower flow passage, the middle flow passage, and the upper flow passage.

13. (Original) The device as claimed in claim 12, wherein ends of the nozzle members and the connection holes in the partitions are staggered with respect to one another.

14. (Original) The device as claimed in claim 7, wherein an upper portion of each of the at least one pair of supporting members is attached to one end of each of the nozzle members and comprises:

a lower supporting member having a plurality of pass through holes formed at fixed intervals and configured to receive therein one end portion of each of the nozzle members; and

an upper supporting member joined to an upper portion of the lower supporting member and having pass through holes provided at positions corresponding to the pass through

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holes in the lower supporting member, wherein a sealing device is provided between each of the pass through holes in the lower supporting member and each of the pass through holes in the upper supporting member, thereby fixedly holding the end portions of the nozzle members.

15. (Original) The device as claimed in claim 14, wherein the sealing device is an elastic sealing ring.

16. (Original) The device as claimed in claim 15, wherein the sealing ring is formed of silicone.

17. (Original) The device as claimed in claim 14, wherein the end portion of each of the nozzle members has a groove for receiving therein a portion of the sealing device.

18. (Original) The device as claimed in claim 1, wherein the at least one supporting member is arranged in parallel to the press unit.

19. (Original) The device as claimed in claim 1, wherein the at least one supporting member comprises an inlet in communication with a source of cooling fluid.

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20. (Original) The device as claimed in claim 1, wherein the at least one cooling fluid spray unit comprises a plurality of cooling fluid spray units, each comprising a nozzle member configured to be interposed between respective push bars of the press unit and extending parallel thereto.

21. (Previously Presented) A modular IC test handler, comprising:
a plurality of test sockets;
a press unit including a frame and a plurality of push bars arranged at fixed intervals on a front surface of the frame for pushing edges of modular ICs mounted on carriers to connect the modular ICs to the plurality of test sockets; and
a device for compensating for heat generation from the modular ICs during testing, the device comprising:
at least one supporting member provided adjacent to the press unit and having a cooling fluid flow passage formed therein for flow of cooling fluid; and
at least one cooling fluid spraying unit configured to spray the cooling fluid supplied through the cooling fluid flow passage toward faces of modular ICs in an oblique direction with respect to a central plane of the at least one cooling fluid spraying unit.

22. (Original) The device as claimed in claim 21, wherein the at least one cooling fluid spraying unit comprises a plurality of cooling fluid spraying units.

23. (Original) The device as claimed in claim 21, wherein the at least one supporting member comprises a pair of supporting members, each having a cooling fluid flow passage formed therein.

24. (Original) The device as claimed in claim 23, wherein each of the at least one cooling fluid spray comprises:

a nozzle member having ends connected to the cooling fluid flow passages in the at least one pair of supporting members so as to be in communication therewith and arranged between adjacent push bars, each nozzle member having at least one cooling fluid spraying hole.

25. (Original) The device as claimed in claim 24, wherein the nozzle member comprises a plurality of cooling fluid spray holes formed at fixed intervals in a longitudinal direction of the nozzle member and directed away in a circumferential direction from a central plane the nozzle member forms, and wherein the plurality of cooling fluid spray holes is configured to spray the cooling fluid guided through the nozzle member toward the modular ICs in an oblique direction.

26. (Original) The device as claimed in claim 25, wherein the plurality of cooling fluid spray holes are arranged in a plurality of pairs.

27. (Original) The device as claimed in claim 21, wherein the cooling fluid flow passage in each of the at least one supporting member is divided into a plurality of cooling fluid flow passages by at least one partition extending in a lateral direction.

28. (Original) The device as claimed in claim 27, wherein the plurality of cooling fluid flow passages comprise an upper flow passage, a middle flow passage, and a lower flow passage, and wherein the upper flow passage is in communication with end portions of a nozzle member of the at least one cooling fluid spray unit and the lower flow passage has an inlet configured to receive the cooling fluid from an exterior.

29. (Original) The device as claimed in claim 28, wherein the partitions have a plurality of connection holes provided at fixed intervals for flow of the cooling fluid introduced thereto through the lower flow passage, the middle flow passage, and the upper flow passage.

30. (Original) The device as claimed in claim 29, wherein ends of the nozzle members and the connection holes in the partitions are staggered with respect to one another.

31. (Original) The device as claimed in claim 21, wherein the at least one cooling fluid spray unit comprises a plurality of cooling fluid spray units, each comprising a nozzle member configured to be interposed between respective push bars of the press unit and extending parallel thereto.

32. (Original) A device for compensating for heat generation in a modular IC test handler configured to receive cooling fluid from an exterior source and spray the cooling fluid onto modular ICs during testing, wherein the device is attached to a press unit including a frame and a plurality of push bars arranged at fixed intervals on a front surface of the frame for pushing edges of modular ICs mounted on carriers to connect the modular ICs to test sockets, the device comprising:

at least one supporting member provided adjacent to the press unit and having a cooling fluid flow passage formed therein for flow of cooling fluid; and

at least one cooling fluid spraying unit configured to be supported by the at least one supporting member so as to be interposed between the plurality of push bars of the press unit and configured to spray the cooling fluid supplied through the cooling fluid flow passage toward modular ICs connected to the test sockets of handler.

33. (Original) The device as claimed in claim 32, wherein the at least cooling fluid spraying unit is configured to extend parallel to the push bars.

34. (Original) The device as claimed in the claim 32, wherein the at least one cooling fluid spraying unit is configured to spray the cooling fluid supplied through the cooling fluid flow passage toward faces of modular ICs in an oblique direction with respect to a planar surface formed by the at least one cooling fluid spraying unit.

35. (New) A method for compensating for heat generation in a modular IC test handler, the method comprising:

loading modular ICs onto a press unit of a handler;
introducing cooling fluid into cooling fluid passages formed in a supporting member provided adjacent to the press unit; and
spraying cooling fluid through at least one cooling fluid spraying unit toward faces of the modular ICs in a direction which is oblique with respect to a central plane of the at least one cooling fluid spraying unit.